State of Washington
Hazard Mitigation Plan

Plan Summary
March 2004 Draft

Washington Military Department
Emergency Management Division

WASHINGTON STATE
HAZARD MITIGATION PLAN
SUMMARY

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Washington Military Department
Emergency Management Division
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Plan Summary

Introduction

The purpose of the Washington State Hazard Mitigation Plan is to provide guidance for hazard mitigation in the State of Washington. It identifies hazard mitigation goals, objectives and recommended actions and initiatives for state government that will reduce injury and damage from natural hazards. Agency annexes to the plan provide strategies for participating state agencies that will improve their resistance to a natural hazard-caused disaster. Agency annexes are not included as part of this document, but are available separately.

This plan meets requirements for a Standard State Plan under Interim Final Rule 44 CFR 201.4, and for an Enhanced State Plan under Interim Final Rule 44 CFR 201.5, both published by the Federal Emergency Management Agency on February 28, 2002.

The state plan only addresses natural hazards at this time, as that is the requirement of the federal regulations cited above. The second edition of the plan, due in 2007, will address manmade and technological hazards, including terrorism, in addition to natural hazards.

This plan keeps the State of Washington qualified to obtain all disaster assistance including hazard mitigation grants available through the Robert T. Stafford Disaster Relief and Emergency Assistance Act, P.L. 93-288, as amended. The enhanced elements of this plan allow the state to obtain greater funding for hazard mitigation planning and projects (20 percent of federal Stafford Act disaster expenditures versus 7.5 percent for a standard state plan) following a Presidential Declaration of Disaster. It also keeps the state eligible for the Pre-Disaster Mitigation Program, available annually, and the Flood Mitigation Assistance Program, available annually.

Without this plan, the State of Washington – and all eligible local jurisdictions – would be ineligible to receive a variety of disaster recovery programs, including the Public Assistance Program to repair or replace damaged public facilities, and the Fire Management Assistance Program to help the state and communities recover the costs of fighting major wildland fires. However, the state and local communities would remain eligible for certain emergency assistance and Human Services programs available through the Stafford Act.

The Planning Process

The Washington State Hazard Mitigation Plan is the product of thousands of hours of work and the effort of people from many organizations. The plan builds on a number of mitigation planning initiatives since 1990, rather than start from a clean sheet of paper.

Staff from the Mitigation Section of the Washington Military Department's Emergency Management Division led the development effort of the new state plan. The division's Hazard Mitigation Strategist directed the planning effort.

Plan Summary

A State Hazard Mitigation Advisory Team assembled by the Mitigation Section provided guidance and assisted with development of the State Hazard Mitigation Plan, including review of previous hazard mitigation planning initiatives and development of Mitigation Strategy and the Action Plan. The 22 members of the team provided expertise and perspective to the planning process, including state and local emergency management, natural hazards, land-use planning, building codes, transportation, and infrastructure.

Once the state plan is completed, promulgated by the Governor, and approved by the Federal Emergency Management Agency, the team will function as an advisor to the State Hazard Mitigation Strategist on hazard mitigation efforts, including review and revision of the state plan.

The Emergency Management Council will review the planning process, the state plan's Mitigation Strategy, and in March develop a recommendation for the Governor to adopt the plan. The 17-member Council advises the Governor on emergency management practices and issues, including hazard mitigation and damage reduction efforts. Its members represent local government, law enforcement, the fire service, seismic safety, the emergency management community, state agencies, search and rescue volunteers, emergency medical professionals, building officials, and private industry.

Participation of state agencies was critical in the development of the state plan. Thirty state agencies (listed below) participated by identifying potential vulnerable facilities and writing agency-specific annexes to address their vulnerabilities through mitigation actions and initiatives.

Department of Agriculture	Office of the Attorney General
Big Bend Community College	Department of Community Trade and Economic Development
Department of Employment Security	Everett Community College
Environmental Hearing Office	Department of General Administration
Department of Health	Higher Education Coordinating Board
Department of Information Services	Department of Labor and Industries
Department of Licensing	Liquor Control Board
Marine Employees Commission	Military Department
Office of Financial Management	Office of the Insurance Commissioner
Department of Revenue	State School for the Blind
State School for the Deaf	Seattle Central Community College
Department of Social and Health Services	South Puget Sound Community College
State Auditors Office	State Patrol

University of Washington	Utilities and Transportation Commission
Washington Horse Racing Commission	Western Washington University

These agencies own or lease 2,551 facilities of the more than 11,000 state facilities tracked by the State Office of Financial Management in its annual inventory of state assets.

To ensure the accuracy and completeness of information on hazards, validate criteria to identify local jurisdictions most vulnerable to each hazard, and ensure conformity to federal hazard mitigation planning requirements, each Hazard Profile was subject to a thorough review by hazard experts.

Finally, local emergency managers reviewed and provided comment on the state plan.

Coordination of Local Planning

The Mitigation Section of the Washington Military Department's Emergency Management Division has worked with local jurisdictions to encourage and support local hazard mitigation planning since publication of hazard mitigation planning regulations in February 2002. The section's staff provided assistance in a number of ways, including on-site visits and providing training, planning grants and planning software, hazard and socio-economic information and coordinating information requests from state government, and participating in local plan development activities.

Through October 2003, section staff met with more than 200 jurisdictions to discuss the hazard mitigation planning requirement or provide training; helped 33 jurisdictions receive planning grants; provided 23 counties and 2 cities with mitigation planning software; and provided hazard profiles, social and economic descriptions of the state's nine regions, and other information pertinent to the hazard mitigation planning process.

To be as effective and complete as possible, the Washington State Hazard Mitigation Plan should incorporate information on hazards and risk assessment from local plans. Because of the limited number of local plans approved to date, this edition of the plan only reflect in a general manner the findings of local plan risk assessments and themes from the goals and objectives of the local plan mitigation strategies. More than 30 multi-jurisdiction local hazard mitigation plans should be completed and approved before the second edition of the state plan is developed in 2007. This number of plans, and the areas they represent, should provide adequate information to influence and inform both the Risk Assessment and the Mitigation Strategy of the state plan.

Prioritizing Recipients for Hazard Mitigation Grants

The process used to review, evaluate and select projects for hazard mitigation grants builds on years of public participation, and it supports the state's home-rule form of government.

The state's Hazard Mitigation Program uses a competitive system to evaluate and recommend projects for funding. Both federal and state criteria are used; among the state criteria are requirements that potential grant applicants demonstrate good standing in the National Flood Insurance Program and have a current approved Critical Areas Ordinance and / or a current approved comprehensive land-use plan required by the State Growth Management Act.

Projects recommended for funding are those that best document their ability to reduce future impacts of natural disasters as well as demonstrate cost-effectiveness through a benefit-cost review. Only projects with a minimum benefit-cost ratio of 1-to-1 receive further consideration by a review committee.

Typically, hazard mitigation funds following a disaster are available on a competitive basis to all eligible agencies and organizations statewide.

Maintaining the Plan

The Washington State Hazard Mitigation Plan is a living document and will be reviewed, updated and adopted by state officials and submitted to the Federal Emergency Management Agency for approval every three years. The plan will be revised more frequently if conditions under which the plan was developed materially change – through new or revised state policy, a major disaster, or availability of funding, for example – to reflect the new reality of hazard mitigation in Washington State.

Those who will participate in the maintenance of this plan include the State Hazard Mitigation Advisory Team; representatives of the state agencies that participated in development of the state plan; and representatives of local jurisdictions whose hazard mitigation plans influenced the development of the state plan.

Review of the state plan will take place in three ways:

- Annually, for progress made on mitigation actions and projects identified in the Mitigation Strategy of the state plan and in the agency annexes.
- After each major disaster in Washington State declared by the President, to look for areas where the state plan should to be refocused due of the impact of the disaster.
- Every three years before the state plan is resubmitted for approval to the Federal Emergency Management Agency.

State agencies will review and revise their annexes to the state plan using the processes they identified and described in their annexes.

The process used to monitor the implementation of mitigation measures identified in the plan will be similar to the one used to monitor, evaluate and update the content of the plan.

Review on progress implementing the actions and projects identified in the state plan's Mitigation Strategy and in state agency annexes will occur every six months. State agencies that are part of the state plan will submit brief progress reports on a semi-annual basis, with the schedule to be determined by the date of the state plan approval. The Washington Emergency Management Division's Mitigation Section will track progress of actions and projects identified in the state plan and agency annexes.

Risk Assessment

The *State Hazard Identification and Vulnerability Assessment, April 2001* identifies nine natural hazards that have the greatest potential to adversely affect the people, environment, economy and property of the state Washington – avalanche, drought, earthquake, flood, landslide, severe storm, tsunami, volcano, and wildland fire. The state has received 37 Presidential Disaster Declarations for natural hazard events since 1956.

Below are synopses of these hazards and the risk they pose to facilities of the state agencies participating in the development of this plan.

Avalanche – Avalanches have killed more than 190 people in the past century, exceeding deaths from any other natural hazard in Washington State. Most victims are involved in recreation activities in the mountain backcountry where there is no avalanche control. Avalanches occur in four mountain ranges in the state – the Cascade Range, which divides the state east and west, the Olympic Mountains in northwest Washington, the Blue Mountains in southeast Washington, and the Selkirk Mountains in northeast Washington.

Based on the location of key transportation routes and recreational areas threatened by avalanche, parts of the following counties are most vulnerable to avalanche:

Asotin	King	Okanogan	Skamania
Chelan	Kittitas	Pend Oreille	Snohomish
Ferry	Klickitat	Pierce	Whatcom
Garfield	Lewis	Skagit	Yakima

State agencies participating in this plan have not identified any other state-owned facilities as being vulnerable to avalanche.

Drought – Drought threatens crops that rely on natural precipitation, threatens supplies of water for irrigated crops and for communities, and increases the threat of wildfires from dry conditions in forest and rangelands. It also threatens the supply of electricity in Washington, as hydroelectric plants generate nearly three-quarters of the electricity produced in the state.

The following counties are most vulnerable to the impacts of drought, based on their

history of drought, demand on available water for crops and people, and inability to endure the economic conditions brought about by drought:

Adams	Benton	Chelan	Douglas	Franklin
Grant	Kittitas	Klickitat	Okanogan	Yakima

State agencies participating in the plan have determined that 218 state-owned facilities are potentially at risk to drought. At their maximum capacity, the facilities house more than 7,617 workers, students, visitors, and residents. The approximate value of state-owned structures is $296 million, and the approximate value of contents of all vulnerable structures is $137 million. Agencies identified 93 critical facilities as potentially at risk to drought. At their maximum capacity, the facilities house more than 5,113 workers, students, visitors, and residents. The approximate value of state-owned structures is $205 million, and the approximate value of contents of all vulnerable structures is $102 million.

Earthquake – More than 1,000 earthquakes occur in Washington each year. A dozen or more quakes are felt; occasionally, they cause damage. The earthquake threat is not uniform; most occur in Western Washington.

Deep earthquakes similar to the magnitude 6.8 Nisqually event in 2001 occur about once every 35 years, while earthquakes similar to the larger, M7.1 Olympia earthquake in 1949 occur about once every 110 years. Powerful subduction zone earthquakes of magnitude 8 to 9 occur off the coast about once every 350 to 500 years. Shallow crustal earthquakes are of particular concern, especially those on active faults in the Puget Lowland, where much of the state's population and economic base is located. Geologists currently believe that a shallow earthquake of magnitude 6.5 or greater occurs on one of these faults about once every 333 years.

The following counties are at greatest risk and most vulnerable to earthquakes based on projected annualized earthquake losses as calculated by HAZUS (Hazards US loss estimation tool), recommendations of state and federal geologists, and size of potentially vulnerable populations and housing stock:

Benton	Chelan	Clallam	Clark	Cowlitz	Grays Harbor
Island	Jefferson	King	Kitsap	Kittitas	Lewis
Mason	Pacific	Pierce	Skagit	Snohomish	Spokane
Thurston	Wahkiakum	Walla Walla	Whatcom		

State agencies participating in the plan have determined that 2,243 state-owned facilities are potentially at risk to earthquake. At their maximum capacity, the facilities house more than 252,400 workers, students, visitors, and residents. The approximate value of state-owned structures is $10.7 billion, and the approximate value of contents of all vulnerable structures is $4.8 billion. Agencies identified 835 critical facilities as

potentially as risk to earthquake. At their maximum capacity, the facilities house more than 92,049 workers, students, visitors, and residents. The approximate value of state-owned structures is $3.8 billion, and the approximate value of contents of all vulnerable structures is $2.3 billion.

Flood – Floods cause loss of life, and damage structures, crops, land, flood control structures, roads, and utilities. Floods also cause erosion and landslides, and can transport debris and toxic products that cause secondary damage.

There have been 27 Presidential Disaster Declarations for flooding in Washington State since 1956. Every county has received a Presidential Disaster Declaration for flooding since 1970. While not every flood creates enough damage to merit such a declaration, most are severe enough to warrant intervention by local, state or federal authorities.

The following counties are at greatest risk and most vulnerable to flooding due to the number of flood disasters, percentage of area in floodplain, number of flood insurance policies in effect and flood insurance claims paid since 1978:

Clark	Cowlitz	Grays Harbor	King	Lewis
Mason	Pacific	Pierce	Skagit	Snohomish
Thurston	Whatcom	Wahkiakum		

State agencies participating in the plan have determined that 455 state-owned facilities are potentially at risk to flooding. At their maximum capacity, the facilities house more than 21,077 workers, students, visitors, and residents. The approximate value of state-owned structures is $525.7 million, and the approximate value of contents of all vulnerable structures is $383.8 million. Agencies identified 196 critical facilities as potentially as risk to flood. At their maximum capacity, the facilities house more than 9,144 workers, students, visitors, and residents. The approximate value of state-owned structures is $217.8 million, and the approximate value of contents of all vulnerable structures is $234 million.

Landslide – Landslide is the movement of rock, soil and debris down a hillside or slope. Landslides take lives, destroy homes, businesses, and public buildings, interrupt transportation, undermine bridges, derail train cars, cover clam and oyster beds and other marine habitat, and damage utilities.

Areas historically subject to landslides include the Columbia River Gorge, the banks of Lake Roosevelt, the Interstate 5 corridor, U.S. 101 Highway corridor along the Pacific Coast and from the coast to Olympia, the Cascade and Olympic mountain ranges, and Puget Sound coastal bluffs.

The following jurisdictions have the greatest vulnerability to landslides based on past landslide damage and information from state and federal landslide experts:

Asotin	Chelan	Clallam	Clark	Columbia
Cowlitz	Ferry	Garfield	Grays Harbor	Island
Jefferson	King	Kitsap	Kittitas	Klickitat
Lewis	Lincoln	Mason	Okanogan	Pacific
Pierce	San Juan	Skagit	Skamania	Snohomish
Stevens	Thurston	Walla Walla	Whatcom	Yakima

State agencies participating in the plan have determined that 485 state-owned facilities are potentially at risk to landslide. At their maximum capacity, the facilities house more than 29,929 workers, students, visitors, and residents. The approximate value of state-owned structures is $917 million, and the approximate value of contents of all vulnerable structures is $635 million. Agencies identified 216 critical facilities as potentially as risk to landslide. At their maximum capacity, the facilities house more than 53,142 workers, students, visitors, and residents. The approximate value of state-owned structures is $682.4 million, and the approximate value of contents of all vulnerable structures is $509.4 million.

Severe storm – All areas of Washington State are vulnerable to severe weather. A severe storm is an atmospheric disturbance that results in one or more of the following phenomena: strong winds, large hail, thunderstorm, tornado, rain, snow, or freezing rain.

Factors used to determine which jurisdictions are most vulnerable to severe storms include analysis by National Weather Service warning coordination meteorologists and frequency of occurrence of various severe storm types.

The following jurisdictions have the greatest vulnerability to high winds:

Benton	Clallam	Clark	Columbia	Cowlitz	Grays Harbor
Island	Jefferson	King	Kitsap	Kittitas	Lewis
Mason	Pacific	Pierce	San Juan	Skagit	Snohomish
Thurston	Wahkiakum	Whatcom	Yakima		

The following jurisdictions have the greatest vulnerability to winter storm:

Clark	Cowlitz	Douglas	Garfield	Grant	King
Kittitas	Mason	Okanogan	Pierce	Skagit	Skamania
Snohomish	Spokane	Thurston	Walla Walla	Whatcom	Yakima

The following jurisdictions have the greatest vulnerability to blizzard:

Adams	Asotin	Clark	Douglas	Ferry	Garfield

Grant	Kittitas	Lincoln	Okanogan	Pend Oreille	Skamania
Stevens	Walla Walla	Whatcom	Whitman		

The following jurisdictions have the greatest vulnerability to dust storm:

Adams	Benton	Columbia	Douglas	Franklin	Grant
Lincoln	Spokane	Walla Walla	Whitman	Yakima	

The following jurisdictions have the greatest vulnerability to severe thunderstorms:

Adams	Asotin	Benton	Chelan	Columbia
Douglas	Ferry	Garfield	Grant	Kittitas
Klickitat	Lincoln	Okanogan	Pend Oreille	Skamania
Spokane	Walla Walla	Whitman	Yakima	

The following jurisdictions have the greatest vulnerability to tornado:

Adams	Asotin	Benton	Clark	Columbia	Cowlitz
Franklin	Garfield	Grant	Grays Harbor	King	Klickitat
Lincoln	Okanogan	Pacific	Pend Oreille	Pierce	Snohomish
Spokane	Stevens	Walla Walla	Whitman	Yakima	

The following jurisdictions have the greatest vulnerability to coastal flooding:

Clallam	Grays Harbor	Island	Jefferson	King
Kitsap	Pacific	Pierce	San Juan	Skagit
Snohomish	Thurston	Whatcom		

State agencies participating in the plan have determined that 2,115 state-owned facilities are potentially at risk to severe storms of all types. At their maximum capacity, the facilities house more than 308,593 workers, students, visitors, and residents. The approximate value of state-owned structures is $9.4 billion, and the approximate value of contents of all vulnerable structures is $3.4 billion. Agencies identified 836 critical facilities as potentially as risk to severe storms. At their maximum capacity, the facilities house more than 90.313 workers, students, visitors, and residents. The approximate value of state-owned structures is $3.86 billion, and the approximate value of contents of all vulnerable structures is $2.28 billion.

Tsunami – The Pacific Coast, Strait of Juan de Fuca, Puget Sound, and large lakes are at risk from tsunamis, trains of powerful, fast-moving waves that threaten people and property along shorelines. Large earthquakes, landslides and volcanic eruptions generate tsunamis. Tsunamis typically cause the most severe damage and casualties

near their source. Nearby populations often have little time to react; persons caught in the path of a tsunami often have little chance of survival.

The following jurisdictions have the greatest vulnerability to tsunamis:

Clallam	Grays Harbor	Island	Jefferson	King
Kitsap	Mason	Pacific	Pierce	San Juan
Skagit	Snohomish	Thurston	Whatcom	

State agencies participating in the plan have determined that 370 state-owned facilities are potentially at risk to tsunamis. At their maximum capacity, the facilities house more than 11,387 workers, students, visitors, and residents. The approximate value of state-owned structures is $211 million, and the approximate value of contents of all vulnerable structures is $190 million. Agencies identified 136 critical facilities as potentially as risk to tsunamis. At their maximum capacity, the facilities house more than 9,660 workers, students, visitors, and residents. The approximate value of state-owned structures is $32 million, and the approximate value of contents of all vulnerable structures is $139.5 million.

Volcano – Washington is home to five major volcanoes – Mount Baker, Glacier Peak, Mount Rainier, Mount St. Helens and Mount Adams – and Oregon's Mount Hood is nearby. Volcanoes can lie dormant for centuries between eruptions. When they erupt, pyroclastic flows, lava flows, and landslides can devastate areas 10 or more miles away, while lahars can inundate valleys more than 50 miles downstream. Falling ash can disrupt human activities hundreds of miles downwind. Lahars pose the greatest risk to public health and safety.

Mount Rainier is one of the most hazardous volcanoes in the United States. It has produced at least four eruptions and numerous lahars in the past 4,000 years. More glacier ice covers the mountain than covers the rest of the Cascades volcanoes combined, and its steep slopes are under constant attack from hot, acidic volcanic gases and water. These factors make this volcano especially prone to landslides and lahars. More than 230,000 people live on former lahars in river valleys below the volcano.

The following jurisdictions are most vulnerable to damaging lahars from a volcanic eruption:

Clark	Cowlitz	King	Klickitat
Lewis	Pierce	Skagit	Skamania
Snohomish	Thurston	Whatcom	

State agencies participating in the plan have determined that 541 state-owned facilities are potentially at risk to lahar from volcanic eruption. At their maximum capacity, the facilities house more than 34,007 workers, students, visitors, and residents. The

approximate value of state-owned structures is $1 billion, and the approximate value of contents of all vulnerable structures is $1.1 billion. Agencies identified 177 critical facilities as potentially as risk to lahar from volcanic eruption. At their maximum capacity, the facilities house more than 10,350 workers, students, visitors, and residents. The approximate value of state-owned structures is $531.6 million, and the approximate value of contents of all vulnerable structures is $310.6 million.

Wildland Fire – Short-term loss caused by wildland fire can include the destruction of timber, wildlife habitat, scenic vistas, and watersheds, and increase vulnerability to flooding. Long-term effects include smaller timber harvests, reduced access to affected recreational areas, and destruction of cultural and economic resources and community infrastructure.

The State Forester has determined the following jurisdictions are most vulnerable to wildland fire due to risk factors that include fire history, types and density of fuels, weather conditions, topography, and number and density of structures:

Adams	Asotin	Benton	Chelan	Clallam
Clark	Columbia	Cowlitz	Ferry	Garfield
Jefferson	King	Kitsap	Kittitas	Klickitat
Lewis	Lincoln	Mason	Okanogan	Pacific
Pend Oreille	Pierce	San Juan	Skagit	Skamania
Snohomish	Spokane	Stevens	Thurston	Wahkiakum
Walla Walla	Whatcom	Whitman	Yakima	

State agencies participating in the plan have determined that 843 state-owned facilities are potentially at risk to wildland fire. At their maximum capacity, the facilities house more than 61,731 workers, students, visitors, and residents. The approximate value of state-owned structures is $1.53 billion, and the approximate value of contents of all vulnerable structures is $1.57 billion. Agencies identified 437 critical facilities as potentially as risk to wildland fire. At their maximum capacity, the facilities house more than 52,159 workers, students, visitors, and residents. The approximate value of state-owned structures is $1.23 billion, and the approximate value of contents of all vulnerable structures is $1.45 billion.

Mitigation Goals and Objectives

The State Hazard Mitigation Advisory Team prepared the goals, objectives, and mitigation actions and initiatives – the mitigation strategy – of the Washington State Hazard Mitigation Plan. This team developed the action agenda that begins on page 14 following presentations and discussions on the impact of natural hazards and on the state's socioeconomic makeup (the risk assessment of this plan); review and discussion of previous mitigation planning initiatives; and review and discussion of the mitigation

goals and objectives of the state agencies participating in development of this plan and of approved local plans.

The mitigation action agenda addresses or solves statewide mitigation issues or problems rather than identifying which state facilities require seismic retrofit, for example; the annexes of the participating agencies appropriately provide the lowest level of detail and actions designed to reduce damage or injuries at the facility level.

The State Hazard Mitigation Advisory Team developed the following mission statement for the State Hazard Mitigation Plan and the following goals and objectives for hazard mitigation.

Mission of the State Hazard Mitigation Plan: Reduce the adverse impacts of natural hazards and losses caused by natural hazard disasters.

State Mitigation Goals and Objectives**:**

Goal 1: Protect Life.

Objective 1.1 – Improve systems that provide warning and emergency communications.
Objective 1.2 – Develop or amend laws so they effectively address hazard mitigation.
Objective 1.3 – Reduce the impacts of hazards on vulnerable populations.
Objective 1.4 – Strengthen state and local building code enforcement.
Objective 1.5 – Train emergency responders.

Goal 2: Protect Property.

Objective 2.1 – Protect critical assets.
Objective 2.2 – Protect and preserve facility contents.
Objective 2.3 – Reduce repetitive losses, including those caused by flooding.

Goal 3: Promote a Sustainable Economy.

Objective 3.1 – Provide incentives for mitigation planning and actions.
Objective 3.2 – Form partnerships to leverage and share resources.
Objective 3.3 – Continue critical business operations.

Goal 4: Protect the Environment.

Objective 4.1 – Develop hazard mitigation policies that protect the environment.

Goal 5: Increase Public Preparedness for Disasters.

Objective 5.1 – Understand natural hazards and the risk they pose.
Objective 5.2 – Improve hazard information, including databases and maps.
Objective 5.3 – Improve public knowledge of hazards and protective measures so individuals appropriately respond during hazard events.
Objective 5.4 – Develop new policies to enhance hazard mitigation initiatives.

Note: Work continues with state agencies to develop projected timelines and potential funding sources for the actions identified in the mitigation strategy.

Goal #1 – Protect Life				
Strategy	**Action**	**Responsible Agency**	**Projected Timeline**	**Resources**
1.1 – Improve systems that provide warning and emergency communications.	1.1.1 – Develop a plan to expand Mount Rainier's lahar warning system beyond stations on the Puyallup and Carbon rivers.	Department of Natural Resources – Division of Geology and Earth Resources, State Emergency Management Division, with US Geological Survey and local jurisdictions		
	1.1.2 – Investigate the feasibility of warning systems on the state's other volcanoes – Mount Baker, Glacier Peak, Mount St. Helens, and Mount Adams – and develop an action plan for installing them.	Department of Natural Resources – Division of Geology and Earth Resources, State Emergency Management Division, with US Geological Survey and local jurisdictions		
	1.1.3 – Develop a plan and seek funding to expand the pilot All-Hazard Alert Broadcasting (AHAB) radio local warning system statewide.	State Emergency Management Division		
	1.1.4 – Develop a plan and seek funding for expansion of NOAA Weather Radio coverage, especially in high terrain areas.	State Emergency Management Division, with the National Weather Service		
	1.1.5 – Investigate the feasibility of developing a real-time landslide warning system along key transportation routes.	Department of Natural Resources – Division of Geology and Earth Resources, Department of Transportation, and State Emergency Management Division with US Geological Survey		

Goal #1 – Protect Life				
Strategy	**Action**	**Responsible Agency**	**Projected Timeline**	**Resources**
	1.1.6 – Develop a plan to install real-time tsunami and earthquake information systems in county and city emergency operation centers.	Department of Natural Resources and State Emergency Management Division with US Geological Survey and National Oceanic and Atmospheric Administration		
1.2 – Develop or amend laws so they effectively address hazard mitigation.	1.2.1 – Develop and promote comprehensive and cost-effective recommendations for local land-use plans and ordinances that reduce the risk of natural hazards, including wildland fire in interface areas.	Department of Natural Resources, with the Department of Community Trade and Economic Development – Growth Management Division		
	1.2.2 – Expand the number of local governments that include hazard reduction planning into their land-use plans and development regulations.	Department of Community Trade and Economic Development – Growth Management Division, with State Emergency Management Division		
	1.2.3 – Develop and promote recommendations for local ordinances to prevent fires in interface areas resulting from fireworks, debris burning, campfires, and other human-caused sources.	Department of Natural Resources, with Department of Community Trade and Economic Development – Local Government Division and Washington State Patrol – Office of the State Fire Marshal		
	1.2.4 – Identify and resolve conflicts in laws and regulations that currently prevent effective fuel management in wildland fire interface areas.	Department of Natural Resources, with Department of Community Trade and Economic Development – Local Government Division		

Goal #1 – Protect Life				
Strategy	**Action**	**Responsible Agency**	**Projected Timeline**	**Resources**
	1.2.5 – Request the Governor's Office prepare an executive order requiring state agencies to include hazard mitigation actions into owned and leased structures upon first occupancy, into renovation of existing owned structures, and into the design or redesign of interior work spaces.	State Emergency Management Division, with Department of General Administration and Governor's Emergency Management Council		
1.3 – Reduce the impacts of hazards on vulnerable populations	1.3.1 – Help K-12 schools and state colleges and universities develop vulnerability assessments, mitigation plans and mitigation projects to improve safety in their most vulnerable buildings.	State Emergency Management Division, with Office of Superintendent of Public Instruction, public schools and higher education institutions		
	1.3.2 – Develop a pilot project that provides funding or incentives for non-structural seismic mitigation in low-income households and for housing that is vulnerable to the effects of natural hazards.	Department of Community Trade and Economic Development – Housing and Local Government Divisions, with State Emergency Management Division		
1.4 – Strengthen state and local building codes and enforcement.	1.4.1– Pursue certification of building inspectors through code organizations and provide continuing education to improve the quality of building inspections.	State Building Code Council, with Washington Association of Building Officials		
1.5 – Train emergency responders.	1.5.1 – Deliver standardized training on wildland fires to firefighters responding to fires in interface areas.	Department of Natural Resources – Resource Protection Division, with Washington State Patrol – Office of the State Fire Marshal, and the state's fire services		

Goal #2 – Protect Property				
Strategy	**Action**	**Responsible Agency**	**Projected Timeline**	**Resources**
2.1 – Protect critical assets.	2.1.1 – Prioritize structural and non-structural retrofits for critical state-owned facilities based on their vulnerability to natural hazards.	Department of General Administration		
	2.1.2 – Develop a plan and seek funding for installing backup electric and telecommunication systems in critical state-owned facilities.	Department of General Administration and Department of Information Services		
	2.1.3 – Develop a pilot project that analyzes vulnerability of various school construction types to earthquake damage and recommend mitigation measures for each construction type.	State Emergency Management Division, with the State Building Code Council		
	2.1.4 – Develop model vulnerability assessment for local water systems and sewage treatment facilities, and provide incentives for mitigation actions that allow these systems to function in during hazard events.	Department of Health		
	2.1.5 – Develop a plan to examine the vulnerability of transportation infrastructure and lifelines along the Interstate 5 corridor from Vancouver, B.C., to Portland, OR, and the Interstate 90 corridor from Seattle to Coeur d'Alene, ID, using the recently completed Port to Port Transportation Corridor Earthquake Vulnerability Study as a model. The plan should include strategies to obtain funding for this work.	State Emergency Management Division, with Department of Transportation and others		
2.2 – Protect and preserve facility contents.	2.2.1 – Develop a pilot project that provides funding or incentives for non-structural seismic mitigation in facilities that serve vulnerable populations (i.e., children, elderly, low income).	State Emergency Management Division, with Department of Community Trade and Economic Development – Local Government Division, Department of Social and Health Services, and Department of Health		

Goal #2 – Protect Property				
Strategy	**Action**	**Responsible Agency**	**Projected Timeline**	**Resources**
	2.2.2 – Help state agencies and the state's colleges and universities assess the seismic safety of facilities in high-risk areas and develop recommendations to mitigate seismic hazards.	Department of General Administration and State Emergency Management Division, with state agencies and higher education institutions		
	2.2.3 – Encourage increased funding to speed up mitigation of identified seismic hazards in vulnerable state agency facilities and the state's colleges and universities.	State Emergency Management Division, Department of General Administration, and Higher Education Coordinating Board		
2.3 – Reduce repetitive losses, including those caused by flooding.	2.3.1 – Help communities identify repetitive loss areas and potential funding for mitigation in those areas.	Department of Ecology – Floodplain Management, Department of Natural Resources, with State Emergency Management Division		
	2.3.2 – Streamline the permitting and funding processes for flood damage reduction and stream improvement projects.	Department of Ecology – Floodplain Management, Department of Fish and Wildlife, and Governor's Office of Regulatory Assistance		
	2.3.3 – Update guidelines for comprehensive flood hazard management plans, the state model flood damage prevention ordinance, and policy guidance to reduce flood losses.	Department of Ecology – Floodplain Management		
	2.3.4 – Encourage communities to record high water marks to improve or update flood maps or develop other measures to reduce flood damage.	Department of Ecology – Floodplain Management		

Goal #2 – Protect Property				
Strategy	**Action**	**Responsible Agency**	**Projected Timeline**	**Resources**
	2.3.5 – Seek additional resources to expand the Flood Control Assistance Account Program.	Department of Ecology – Floodplain Management		

Goal #3 – Promote A Sustainable Economy				
Strategy	**Action**	**Responsible Agency**	**Projected Timeline**	**Resources**
3.1 – Provide incentives and resources for mitigation planning	3.1.1 – Provide grants, planning tools, training and technical assistance to increase the number of public and private sector hazard mitigation plans and initiatives.	State Emergency Management Division		
	3.1.2 – Develop a web-based hazard risk awareness tool to help state and local emergency managers take steps to reduce the impacts of potential imminent hazard events.	State Emergency Management Division		
	3.1.3 – Develop a hazard event database to help state and local emergency managers with hazard mitigation and other planning initiatives.	State Emergency Management Division		
	3.1.4 – Develop state hazard profiles for manmade and technological hazards.	State Emergency Management Division		
3.2 – Form partnerships to leverage and share resources.	3.2.1 – Provide incentives to increase the number of multi-jurisdictional local partnerships developing hazard mitigation plans.	State Emergency Management Division		
	3.2.2 – Increase the number of state agencies participating as planning partners in the State Hazard Mitigation Plan.	State Emergency Management Division		

Goal #3 – Promote A Sustainable Economy				
Strategy	**Action**	**Responsible Agency**	**Projected Timeline**	**Resources**
3.3 – Continue critical business operations.	3.3.1 – Help state agencies develop continuity of operations and evacuation/relocation plans for critical business operations located in high-risk hazard areas, including lahar inundation zones and areas of high seismic risk.	State Emergency Management Division, with Department of Natural Resources – Division of Geology and Earth Resources		
	3.3.2 – Help state agencies develop, implement and test mandated plans to ensure their information technology infrastructure are protected against service interruptions, including those caused by large-scale disasters.	Department of Information Services – Information Services Board		

Goal # 4 – Protect The Environment				
Strategy	**Action**	**Responsible Agency**	**Projected Timeline**	**Resources**
4.1 – Develop hazard mitigation policies that protect the environment.	4.1.1 – Establish a working group with electric utilities to explore development of recommendations for selective de-energizing of power lines to reduce the risk of wildland fire in interface areas during emergencies.	Department of Natural Resources – Resource Protection Division, with Utilities and Transportation Commission and Department of Community Trade and Economic Development – Energy Office		

Goal # 4 – Protect The Environment				
Strategy	**Action**	**Responsible Agency**	**Projected Timeline**	**Resources**
	4.1.2 – Establish a working group with electric utilities to explore development of recommendations on cost-effective use of underground cable in high-risk hazard areas, including wildland fire interface areas.	Department of Natural Resources – Resource Protection Division, with Utilities and Transportation Commission and Department of Community Trade and Economic Development – Energy Office		
	4.1.3 – Develop and implement effective silviculture strategies that improve the health of forests and reduce the amount of fuels available for wildland fires from dead and dying trees.	Department of Natural Resources – Resource Protection Division		
	4.1.4 – Develop a plan to dispose of disaster debris in a manner that protects critical habitat and environmentally sensitive areas.	Department of Natural Resources – Resource Protection Division and Department of Transportation		

Goal # 5 – Increase Public Preparedness For Disasters				
Strategy	**Action**	**Responsible Agency**	**Projected Timeline**	**Resources**
5.1 – Understand natural hazards and the risk they pose.	5.1.1 – Ensure that hydraulic analysis of watersheds and updated flood maps use the most current modeling available in order to provide an accurate portrayal of anticipated flood conditions.	Department of Ecology		
	5.1.2 – Establish minimum standards and develop a model checklist for geotechnical reports.	Department of Natural Resources – Division of Geology and Earth Resources, with Department of Licensing		

Goal # 5 – Increase Public Preparedness For Disasters				
Strategy	**Action**	**Responsible Agency**	**Projected Timeline**	**Resources**
	5.1.3 – Establish a funded program for state agency or peer review of geotechnical and geologic reports to ensure their accuracy and basis on best available science.	Department of Natural Resources – Division of Geology and Earth Resources		
	5.1.4 – Seek additional funding for the state's geologic survey for research to improve understanding of the threats posed by earthquakes, landslides, and other geologic hazards in Washington.	Department of Natural Resources – Division of Geology and Earth Resources, with Governor's Emergency Management Council		
	5.1.5 – Seek additional funding for maintenance and expansion of the Pacific Northwest Seismic Network, and for deploying the Advanced National Seismic System.	Department of Natural Resources – Division of Geology and Earth Resources, State Emergency Management Division, with University of Washington and Governor's Emergency Management Council		
	5.1.6 – Obtain funding to complete tsunami modeling for all coastal area of the state, including Puget Sound.	State Emergency Management Division, with Department of Natural Resources – Division of Geology and Earth Resources		
5.2 – Improve hazard information, including databases and maps.	5.2.1 – Develop and maintain an inventory of existing geographical databases for natural hazards.	Department of Natural Resources, with State Emergency Management Division and State Geographic Information Council		

Goal # 5 – Increase Public Preparedness For Disasters				
Strategy	**Action**	**Responsible Agency**	**Projected Timeline**	**Resources**
	5.2.2 – Accelerate mapping of natural hazard areas around the state, including tsunami inundation areas in coastal areas, and develop GIS-compatible database products for them.	Department of Natural Resources – Division of Geology and Earth Resources		
	5.2.3 – Develop and maintain a central repository of geotechnical, geologic and hydrologic historical data.	Department of Natural Resources – Division of Geology and Earth Resources		
	5.2.4 – Develop maps with information on land ownership, response boundaries, roads, and other features to allow fire fighting agencies to adequately prepare for response to wildland fires in interface areas.	Department of Natural Resources – Resource Protection Division		
	5.2.5 – Develop a real-time monitoring program for critical state bridges and make the data available for use in regional shake maps.	Department of Transportation and University of Washington		
5.3 – Improve public knowledge of hazards and protective measures so individuals appropriately respond during hazard events.	5.3.1 – Assess the state's public education program on emergency preparedness and disaster resistance to determine its effectiveness and establish a baseline for future education efforts.	State Emergency Management Division		

Goal # 5 – Increase Public Preparedness For Disasters				
Strategy	**Action**	**Responsible Agency**	**Projected Timeline**	**Resources**
	5.3.2 – Develop and implement a coordinated state all-hazard public education strategy that builds on the results of the assessment of previous education efforts. The strategy shall address development of programs and materials that: • Motivate individuals and families to take action to prepare for and then respond appropriately to hazard events. • Are culturally relevant for various ethnic populations. • Address the needs of special population groups, including but not limited to school children, senior citizens, and low-income families.	State Emergency Management Division		
	5.3.3 – Develop and implement a comprehensive public education program that increases awareness of the wildland interface fire risk and promotes actions that reduce the risk of fire to life and property.	Department of Natural Resources – Resource Protection Division		
	5.3.4 – Expand the concept of the disaster information clearinghouse (e.g., Nisqually Earthquake Clearinghouse) into a multi-hazard information center.	State Emergency Management Division, in conjunction with Department of Natural Resources – Division of Geology and Earth Resources, and Federal Emergency Management Agency		
	5.3.5 – Propose legislation requiring disclosure in the real estate sales process of natural hazards affecting the subject property.	State Emergency Management, with Department of Natural Resources		

Goal # 5 – Increase Public Preparedness For Disasters				
Strategy	**Action**	**Responsible Agency**	**Projected Timeline**	**Resources**
5.4 – Develop new policies to enhance hazard mitigation initiatives.	5.4.1 – Research and develop the rationale for a permanent state organization (board, commission, etc.) to establish, coordinate, and evaluate state policy on seismic safety.	State Emergency Management Division, with Department of Natural Resources and Governor's Emergency Management Council		
	5.4.2 – Educate key state officials and policy makers about the state's natural hazards, the threats they pose, and strategies to reduce the risk.	State Emergency Management Division, with Governor's Emergency Management Council		